**APPENDIX:**

1. Format of Data Presentation Using Hypothetical CLABSI Data

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| --- | --- | --- | --- | --- | --- |
| **Hospital Name** | **Actual Number of Infections** | **Number of Central-line Days (CLDs)** | **Raw Rates (# infections per 1,000 CLDs)** | **Number of Infections Projected by National Experience for Reference Cohort** | **Ratio of Actual to Projected Infections (SIR)** |
| **Hospital A** | 7 | 6,500 | 1.08 | 3.7 | 1.89 |
| **Hospital B** | 13 | 9,000 | 1.44 | 10.8 | 1.20 |
| **Hospital C** | 1 | 16,000 | 0.06 | 1.4 | 0.71 |
| **Hospital D** | 12 | 20,000 | 0.60 | 14.3 | 0.84 |
| **Hospital E** | 4 | 10,000 | 0.40 | 3.3 | 1.21 |
| **Hospital F** | 7 | 14,600 | 0.48 | 10.9 | 0.64 |
| **Hospital G** | 2 | 7,000 | 0.29 | 2.7 | 0.74 |
| **Hospital H** | 2 | 12,000 | 0.17 | 4.3 | 0.47 |
|  |  |  |  |

\*Standardized infection ratio (SIR). This is defined as the ratio of actual CLABSI over the projected number of CLABSI.

1. Survey answer explanations. Each question appeared on a webpage that also included the data table. Tweet examples and the CLABSI knowledge filter question can also be seen at the end of the appendix.

*Question:* Which hospital uses the most central lines?

*Concept category:* Basic Numeracy

*Rationale:* Number of central-line days is the measure of central line usage. Therefore, the respondent had to go to column 3 and find the hospital with the highest number.

*Correct Answer:* hospital D (90% correct)

*Question:* Which hospital has the lowest CLABSI rate?

*Concept category:* Basic Numeracy

*Rationale:* The fourth column provided the raw CLABSI rates for each hospital. The respondent needed to go to this column and find the hospital with the lowest number.

*Correct Answer:* hospital C (80% correct)

*Question:* If hospital G’s number of actual infections doubled, what would its CLABSI rate be?

*Concept category:* Basic Numeracy

*Rationale:* Actual infections and CLABSI rate are related in that CLABSI rate = (actual infections) / (central-line use). Therefore, if the number of actual infections is doubled, the CLABSI rate would subsequently be doubled.

*Correct Answer:* 0.58. Any answer between 0.50 and 0.60 was accepted as a correct response (77% correct).

*Question:* If hospital A doubled its central-line use but other practice patterns remained the same, how many actual infections would hospital A expect to have?

*Concept category:* Basic Numeracy

*Rationale:* Practice patterns determine the rate of CLABSI; if there is no change in practice patterns, there should be no change in rate regardless of the number of patients to whom those practices apply.

Central-line use, actual infections, and CLABSI rate are related in that CLABSI rate = (actual infections) / (central-line use). The question doubled the denominator of the rate, but held the rate constant, meaning that the numerator must also double. That is, the actual number of infections would need to double in order to maintain the same CLABSI rate.

*Correct Answer:* 14. 14.04 was also accepted as a correct response (79% correct).

*Question:* Which is better: a higher or lower SIR?

*Concept category:* Risk-Adjustment Numeracy

*Rationale:* SIR, or standardized infection ratio, is the ratio of actual infections to projected infections. A hospital is performing better if their actual infections are lower than their projected infections. Therefore, a lower SIR is better.

*Correct Answer:* lower (95% correct).

*Question:* If hospital B had its number of projected infections halved, what is its SIR?

*Concept category:* Risk-Adjustment Numeracy

*Rationale:* SIR, or standardized infection ratio, is the ratio of actual infections to projected infections. Therefore, if a hospital has its number of projected infections halved (the denominator of SIR), this will double the SIR.

*Correct Answer:* 2.4. Any answer between 2.0 and 3.0 was accepted as a correct response (46% correct).

*Question:* The presence of a gastrostomy (g) tube is a risk factor for CLABSI. If this variable is not accounted for in CLABSI reporting, how would this impact the interpretation of the number of infections projected by national experience?

*Concept category:* Risk-Adjustment Interpretation

*Rationale:* The number of infections projected by national experience is a risk-adjusted statistic that takes into account known factors to impact the development of CLABSI. Unaccounted risk factors lead those projections to be wrong for an individual hospital. If an unaccounted risk factor is abundant, then more infection will happen at that hospital, and the number of projected infections will be too low. If an unaccounted risk factor is rare, then fewer infections will happen at that hospital, the number of projected infections will be too high.

*Correct Answer:* Underestimation in a hospital with many g-tubes, overestimation in a hospital with few g-tubes. Correct answer defined as selection of either response or selecting both responses (75% correct).

*Question:* Which hospital is most effective at preventing CLABSI?

*Concept category:* Risk-Adjustment Interpretation

*Rationale:* The most effective hospitals at preventing CLABSI are those with the lowest SIR, which is the risk-adjusted CLABSI statistic. This involved identifying the hospital with the lowest number in column 6.

*Correct Answer:* hospital H (51% correct).

*Question:* Suppose hospitals A and H have the exact same CLABSI prevention practices. Which hospital will have the higher number of CLABSI?

*Concept category:* Risk-Adjustment Interpretation

*Rationale:* Practice patterns do not impact risk-adjustment. Therefore, in the case where two hospitals have the same prevention practices, the hospital with patients who are most predisposed to develop CLABSI will have the higher rate. Thus, the higher number of projected infections will result in the higher number of CLABSI – Hospital H’s “4.3” in column 5 is greater than Hospital A’s “3.7”.

*Correct Answer:* hospital H (34% correct)

*Question:* Which hospital’s patients are the most predisposed to developing CLABSI?

*Concept category:* Risk-Adjustment Interpretation

*Rationale:* Patients are most predisposed to developing a condition when they are at the highest risk for the condition irrespective of practice patterns. The number of projected infections by national experience is the data that indicate the predisposition for each hospital’s patients to develop CLABSI. Thus, the hospital with the highest number of projected infections (the highest number in column 5) is the answer.

*Correct Answer:* hospital D (32% correct)

*Question:* Suppose hospital A begins using a central line with an antibiotic coating that halves infections. What would hospital A's number of projected infections be?

*Concept category:* Risk-Adjustment Interpretation

*Rationale:* Practice patterns do not impact risk-adjustment. The number of projected infections for each hospital is a risk-adjusted statistic that does not take practice patterns into account. Therefore, an alteration in prevention practices will result in the same number of projected infections. This required the respondent to look in column 5 for Hospital A and answer that same number, unchanged.

*Correct Answer:* 3.7 (17% correct)

*TWEET EXAMPLES*

1. Calling all clinicians: @UM\_IHPI study needs 10 min of your time to help improve #quality measure reporting. link.com
2. Receive #quality metric data? Help a @UM\_IHPI study make them better w/ 10 minutes of your time
link.com
3. .@UM\_PCCM fellow studying clinician understanding of #quality reports we often get. Have 10 minutes to help? link.com
4. Think you know #CLABSI #quality data? Participate in a new UofM study to assess clinician knowledge: link.com
5. .@UM\_PCCM fellow needs 10 min for a survey re: how we understand #CLABSI #quality measures. Will u help, pls?
link.com
6. A trainee w/ me is studying clinician understanding of #CLABSI #quality reports we often get. 10 min survey: link.com
7. My trainee is examining #CLABSI #quality reports. Pls help him w/ brief survey? link.com

*CLABSI Knowledge Filter Question*

Prove to us you are not a robot by answering this straightforward question about central lines. Which is a common site for a central line?

A. Iliac

B. Aorta

C. Subclavian

D. Radial